TENNESSEE PERINATAL CARE SYSTEM

GUIDELINES FOR REGIONALIZATION, HOSPITAL CARE LEVELS, STAFFING AND FACILITIES

(Fifth Edition)

2004

Tennessee Department of Health
Women's Health / Genetics Section

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Governor

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Commissioner

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Prepared by the
Subcommittee on Regionalization and Care Levels
of the
Perinatal Advisory Committee

2004

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TENNESSEE PERINATAL CARE SYSTEM

GUIDELINES FOR REGIONALIZATION, HOSPITAL CARE LEVELS, STAFFING AND FACILITIES

PREFACE

The first edition of these Guidelines appeared in May 1978; further editions were published in May 1984, March 1990, and June 1997. This fifth edition, as the others before it, was prepared by the Subcommittee on Regionalization and Care Levels and adopted by its parent committee, the Perinatal Advisory Committee. This document is the product of careful consideration by representatives from a broad spectrum of health care delivery disciplines drawn from throughout the state. The Guidelines describe components of various care levels with the full realization that many of these components are already in place while others are goals which are actively pursued.

As described in Tennessee Code Annotated 68-1-802,

(a) The department [of Health] is directed to develop a plan to establish a program for the diagnosis and treatment of certain life-threatening conditions present in the perinatal period.

(b) The program shall assist pregnant women and their fetuses and newborn infants by developing a regionalized system of care, including highly specialized personnel, equipment and techniques that will decrease the existing high mortality rate and the life-long disabilities that currently prevail in surviving newborn infants.

Regionalization of perinatal health care in the State of Tennessee was motivated by an overwhelming need to ease access to contemporary care by as large a segment of the population as was feasible. Since appearance of the first edition, the number of providers of perinatal health care has increased remarkably. There has also been an increase in the level of expertise in most institutions in the state. We must continue to provide professional advice and supervision on perinatal health care to health care providers, thereby making care available to every woman and child in Tennessee regardless of community size.

In order to assure contemporary pertinence of these and subsequent Guidelines, the Perinatal Advisory Committee has limited its approval to a period no longer than five years from the date of approval by the Commissioner of the Department of Health. A revision of this document will be mandatory at that time, unless one becomes necessary at an earlier date.

INTRODUCTION

Professional advice and supervision of health care must be available to every pregnant woman and her newborn child in Tennessee. The vast majority of the newly born are healthy, but intact survival is jeopardized in a substantial number who require complex medical attention. These severe illnesses often can be anticipated and then ameliorated or eliminated by special management of high-risk mothers. In the extreme, this type of medical attention entails recruitment of a variety of specialized professional personnel who are generally more concentrated in densely populated communities. It is in these larger communities that the fullest spectrum of medical consultants, nurse specialists, laboratory capabilities and equipment are usually situated, but complex medical management must be accessible to all patients regardless of community size. That perinatal mortality and morbidity can be substantially reduced by contemporary technology has been plainly documented for decades. From this fact alone, there remains a sense of urgency to make such technology available to all mothers and infants in Tennessee, to eliminate existing inaccessibility to complex care, and to assure a high quality of medical attention in every hospital that renders it, complexity of care and location of hospital notwithstanding.

The overall goal is effective care for the State as a whole. Available resources must be appropriately utilized. All levels of care should be available within a given perinatal region, and each level of care, no matter how complicated, should be of optimal quality. The sole determinant of where care will be administered, and by what types of personnel, should be the severity of illness. Although services should be available as close to home as possible, transfer of patients from one hospital to another is inevitable if all levels of care are to be provided. An effective system requires designation of hospitals for provision of care according to their capacity. These Guidelines have been written for that specific purpose. Beyond care levels, consultation and transport of patients should provide functional continuity between hospitals. Fundamental to all these activities is the continuing education of personnel within perinatal regions; without it the effectiveness of care will deteriorate.

Although these Guidelines are addressed to hospitals as institutional providers of perinatal care, the basic emphasis is on the role of physicians, nurses and other health care personnel who directly and personally provide patient care. Hospitals herein described differ from each other in the variety of services performed by their personnel. The institutional components of the Tennessee Perinatal Care System include four hospital categories that indicate their capacities to provide complex care: Levels I, II-A, II-B, and III. Regional Perinatal Centers are Level III institutions that have been designated by the State to coordinate certain regional activities that relate to professional education, patient transport and inter-hospital functions, as well as care of patients. The general characteristics of each care level are summarized in the paragraphs that follow. Details of these characteristics are set forth in the corresponding care level sections of these Guidelines.

SUMMARY OF
HOSPITAL PERINATAL SERVICE LEVELS

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LEVEL I UNITS

Level I units provide basic care for uncomplicated maternity and neonatal patients. All high-risk mothers and neonates must be promptly identified for referral and/or consultation for more specialized care. The Level I unit shall provide equipment and staff to care for maternity patients whose onset of labor occurs on or after the first day of the 35th week, for neonates whose birthweight is over 2000 grams, or for sick patients pending transfer to another hospital. The Level I unit must also provide care for convalescing neonates who are transferred from other institutions to be closer to home.

LEVEL II-A UNITS

Level II-A units provide care for maternal and neonatal patients born at 34 weeks gestation or above whose courses are uncomplicated, and for patients with mild obstetric and neonatal illnesses who do not require specialized services. The nursery must have equipment and personnel to provide controlled thermal environments, hood oxygen for protracted management, and assisted neonatal ventilation pending transfer to another institution for more specialized care. Obstetric and pediatric co-directors are board certified in their respective specialties.

LEVEL II-B UNITS

Level II-B units are capable of managing more complex maternal and neonatal abnormalities such as care of neonates that require umbilical vessel catheters and protracted mechanical ventilation. In exceptional circumstances, the Level II-B unit may receive patients transferred from Level I and Level II-A institutions. The obstetric co-director is board certified in that specialty. The pediatric co-director is board certified in neonatal-perinatal medicine.

LEVEL III UNITS

Level III units have the capacity to manage the most complex and severe maternal and neonatal illnesses by virtue of their equipment, perinatal staff and on-site availability of a complete spectrum of pediatric sub-specialists. Consultation with specialized physicians elsewhere should rarely be necessary. The Level III institution, if it so chooses, is responsible for providing equipment and qualified staff to transport sick infants from other referring hospitals. The Level III facility is responsible for delivery of a formal ongoing program of education in obstetrics and in neonatal medicine for its staff. The obstetric co-director must be board certified in maternal-fetal medicine. The pediatric co-director must be board certified in neonatal-perinatal medicine.

LEVEL I FACILITIES

LEVEL I FACILITIES

I. SERVICES PROVIDED

The services provided by a Level I facility include education of personnel, education of parents, and uncomplicated maternal and neonatal care. Specifically, the Level I facility should have the capacity to manage uncomplicated pregnancy, labor and delivery; to care for well newborn infants; to identify the signs and symptoms of potential problems in the mother, fetus and neonate; and to stabilize sick mothers and/or infants pending their transfer to a Level II-B, or Level III facility.

A. Educational Services

Educational services should be available as follows:

1. Parent Education: Ongoing perinatal education programs for parents.

2. Nurses' Education: Programs for nurses should conform to the most recent edition of *Tennessee Perinatal Care System Educational Objectives for Nurses, Level I,* published by the Tennessee Department of Health. These courses may be made available periodically at the Level I facility by instructors from a Regional Perinatal Center. The courses may also transpire at a Regional Perinatal Center, or at any other site remote from the hospital, thus requiring that the hospital provide nurses with educational leave for attendance. The Level I hospital is responsible for the necessary arrangements for nurse education.

3. Physicians' Education: A program of educational activities for physicians may be provided in conjunction with the instructional staff of the Regional Perinatal Center.

B. Maternal-Fetal Care

1. Uncomplicated Patients: Prenatal care for uncomplicated patients should meet criteria published in the most recent edition of the *Guidelines for Perinatal Care*, jointly published by the American Academy of Pediatrics and the American College of Obstetricians and Gynecologists.

2. Electronic Monitoring: A capability for continuous electronic monitoring of mother and fetus should be maintained.

3. Complicated Patients: Personnel should be capable of identifying and stabilizing severe maternal-fetal complications that require active intervention before transfer to another facility. There should be an ongoing arrangement for consultative services. This type of intervention requires phone consultation with the referral facility. The availability of anesthesia, radiologic services, and laboratory/blood bank services should be appropriate for effective support of these emergencies.

4. Emergency Cesarean Section: Personnel should maintain the capability to perform emergency cesarean section.

5. Postpartum Care: Personnel should provide care for uncomplicated patients during the postpartum period. In the event of complications, consultation and/or referral should be sought when appropriate.

C. Neonatal Care

A Level I facility should:

1. Normal Infants: Manage normal term or near term infants for whom special care is neither required nor anticipated according to the *Guidelines for Perinatal Care*, jointly published by the American Academy of Pediatrics and the American College of Obstetricians and Gynecologists.

2. Transitional Care: Maintain a protocol for transitional stabilization, examination, and subsequent care of neonates for whom special care is neither required nor anticipated. Careful recurrent observation of the neonate should be performed by personnel who can identify and respond to the early manifestations of neonatal disorders.

3. Distressed Infants: Sustain distressed infants until transfer to a referral facility is feasible. For the most part, these emergency measures are comprised of respiratory support (oxygen therapy, mask ventilation, endotracheal intubation), cardiovascular support, provision of optimal thermal environment, and initiation of appropriate intravascular therapy. The protocol in the Neonatal Resuscitation Program jointly promulgated by the American Academy of Pediatrics and the American Heart Association should be used.

4. Referred Infants: Provide continuing care for infants who are back transferred from a referral facility, after their acute problems have been resolved.

D. Support Services

1. Blood and fresh frozen plasma should be available in-house or on-call 24 hours daily.

2. Anesthesia services will be available for obstetric emergencies including cesarean section, consistent with the *Guidelines for Perinatal Care*, jointly published by the American Academy of Pediatrics and the American College of Obstetricians and Gynecologists.

3. The function of respiratory therapists should be prescribed by the physician of record.

4. Radiologic services should be available 24 hours daily, including the capability to perform portable radiologic studies in the nursery.

5. Clinical laboratory services will be available, including a capacity to perform microanalyses listed in Section V (Laboratory Data) that are for the initial care of sick neonates.

E. Social Services

Mechanisms should be available for provision of social services, either through the hospital or by utilization of public and private agencies.

F. Maintenance of Data

The following information should be recorded for each patient:

1. Maternal

- Name, hospital number
- Age, gravidity, parity, etc.
- Date of first prenatal visit
- Gestation (weeks)
- Prior cesarean section
- Electronic fetal monitoring (Yes or No)
- Induction (Yes or No)
- Indications for induction
- Time of membrane rupture
- Presentation
- Type of delivery (cesarean section, type of forceps, vacuum extraction, spontaneous)
- Indication for cesarean section
- Time of birth
- Birthweight
- Apgar scores (1 and 5 minutes)
- Resuscitation (Yes or No)
- Type of resuscitation
- Maternal-fetal complications
- Status of prenatal testing such as Group B strep, hepatitis B, etc.
- Anesthesia (type)
- Infant status on leaving delivery room (normal, abnormal, expired)
- Physician's name
- Nurse's name
- Disposition
  - Discharged home
  - Transferred to Level II-B or Level III facility
  - Expired

2. Neonatal

- Name, hospital number
- Date of birth
- Birthweight

- Gestational age
- Apgar scores (1 and 5 minutes)
- Maternal complications
- Discharge diagnoses
- Special care administered (specify)
- Disposition
  Discharged home
  Transferred to Level II-B or Level III facility
  Expired

G. Consultation and Transfer

1. Maternal-Fetal: Planned deliveries at gestational ages below 35 weeks should be referred to a Level II-B or Level III facility. Consultation with Level II-B or Level III personnel is indicated if past history, prenatal course, and/or intrapartum or postpartum events indicate that mother or fetus is at risk.

2. Neonatal: Immediate consultation and/or transfer is indicated for infants:

   a. Whose birthweight is 2000 grams or less.
   b. Of any birthweight who require continuation of oxygen therapy after resuscitation at birth.
   c. Who require initiation of oxygen therapy at any time during the nursery stay.
   d. Who require intravenous therapy at any time during the nursery course.
   e. Whose respirations are abnormal, whether or not a need for oxygen is apparent.
   f. Who require other than the routine care that is prescribed for normal neonates, as published in the most recent edition of the *Guidelines for Perinatal Care*, jointly published by the American Academy of Pediatrics and the American College of Obstetricians and Gynecologists.

3. Protocols for maternal-fetal and neonatal transport should conform to the most recent edition of the *Tennessee Perinatal Care System Guidelines on Transportation*, published by the Tennessee Department of Health.

II. PERSONNEL: QUALIFICATIONS AND FUNCTIONS

A. Physicians

Co-directors of Level I facilities should be board certified in obstetrics and pediatrics, respectively. Family practitioners may serve as co-directors if institutional necessity so indicates, or if board-certified individuals are not available.

B. Nursing

1. Required skills and knowledge for perinatal nurses are listed in the latest edition of *Tennessee Perinatal Care System Educational Objectives for Nurses, Level I*, published by the Tennessee Department of Health. All perinatal staff nurses should have the knowledge and skills that are prescribed in this publication.

2. Every Level I facility should have a registered nurse whose primary responsibility is the organization and supervision of nursing services in the labor/delivery area, the newborn nursery and/or the postpartum area.

C. Labor and Delivery

1. The physician or certified nurse midwife should examine the mother at appropriate intervals during labor. He or she should be immediately available during the later stages of labor. The physician should be present when fetal or maternal complications are imminent or apparent. All deliveries should be attended by a physician or certified nurse midwife, and a registered nurse or a licensed practical nurse. The physician or nurse midwife and the nurse should be capable of performing resuscitation of the newborn infant.

2. Responsibility for following the course of labor and the status of the fetus may not be delegated by the physician or certified nurse midwife to anyone except a registered nurse (R.N.) or a licensed practical nurse (L.P.N.). The registered nurse should be responsible for initial evaluation of the woman in labor. A registered nurse or licensed practical nurse is responsible for continuous assessment and evaluation of the course of labor, for the status of the fetus, and for the identification of abnormalities. The nurse should remain in attendance during labor, delivery and the immediate recovery period.

3. If a high-risk mother is unavoidably delivered at a Level I facility, additional qualified personnel should be present for the management of the baby.

4. A written plan should be devised to set forth in detail the procedures for gathering required additional equipment and personnel in the presence of complications.

D. Postpartum Period

1. Mother: The mother's care following delivery should be supervised by a physician or certified nurse midwife and administered by a nurse.

2. Infant: An initial evaluation of every neonate after birth should be performed by the physician responsible for care of the infant or by a nurse (R.N.) with education and experience in the recognition of abnormalities. Thereafter, a nurse should supervise care. Serial observations should be performed according to a clearly delineated protocol that has been established by the medical and nursing personnel of the nursery.

   The care of infants who require transport to another institution should be directly supervised by the physician. In instances of acute distress the physician should be present to the fullest extent possible. The physician's presence is of paramount importance when the transport team arrives.

   Newborn Screening: Hearing and metabolic screening programs should adhere to the most recent State of Tennessee regulations and the most recent edition of *Guidelines for Perinatal Care*, jointly published by the American Academy of Pediatrics and the American College of Obstetricians and Gynecologists.

III. SPACE AND EQUIPMENT FOR INTRAPARTAL AND POSTPARTAL CARE

A. Physical Facilities and Equipment

Physical facilities and equipment should meet criteria published in the latest edition of the *Guidelines for Perinatal Care*, jointly published by the American Academy of Pediatrics and the American College of Obstetricians and Gynecologists. Separate facilities should be maintained for obstetric patients. The obstetric unit may also be utilized for patients with gynecologic problems that do not involve infection.

B. Resuscitation

Provision must be made for resuscitation of infants at delivery. The capability for resuscitation should include assisted ventilation with oxygen administered by bag and mask or bag and endotracheal tube, chest compression, and appropriate intravascular therapy. A treatment station for this purpose should be located in each delivery room with the following: equipment for umbilical vessel catheterization; infant resuscitation bags, masks, and endotracheal tubes in appropriate sizes; laryngoscope and blades; a source of oxygen from wall outlets; suction apparatus; and appropriate drugs. Infusion pumps must be immediately available. An optimal thermal environment for the infant should be provided by a radiant warmer that is immediately available.

IV. SPACE AND EQUIPMENT FOR THE NORMAL INFANT

A. Physical facilities and equipment should meet criteria published in the latest edition of the *Guidelines for Perinatal Care*, jointly published by the American

Academy of Pediatrics and the American College of Obstetricians and Gynecologists.

B. Minimal equipment for care of the normal infant:

1. A positive pressure bag and mask; endotracheal tubes in all the appropriate sizes for neonates.

2. A laryngoscope with premature and infant size blades.

3. Incubators and/or radiant warmers for adequate thermal support.

4. A platform scale, preferably with metric indicators.

5. A phototherapy apparatus.

6. A headbox assembly (oxygen hood), an oxygen blending device, and warming nebulizer for short-term administration of oxygen.

7. Oxygen flow meters, tubing, binasal cannulas for short-term administration of oxygen.

8. A device for the external measurement of blood pressure from the infant's arm or thigh.

9. A controlled source of suction.

10. An oxygen analyzer that displays the ambient concentration of oxygen.

11. A pulse oximeter for non-invasive blood oxygen monitoring.

12. A fully equipped resuscitation cart.

13. Equipment for determination of blood glucose at the bedside.

14. An infusion pump.

V. LABORATORY DATA

A. Maternal

In-house laboratory capabilities should include the following procedures:

- Complete blood count
- Major blood groups and Rh typing; blood crossmatch
- Coombs' test, indirect
- Liver function tests
- Plasma fibrinogen
- Platelet count

- Prothrombin time
- Partial thromboplastin time
- Serum glucose
- Serum sodium, potassium, chloride, bicarbonate, creatinine, BUN, magnesium, and calcium
- Serum protein and albumin
- Urinalysis
- Serologic test for syphilis
- Bacterial cultures (aerobic and anaerobic); sensitivities
- Group B strep screening

B. Neonatal

In-house laboratory capabilities should include the following procedures, utilizing microvolume samples. In most instances, abnormal results will indicate a need for consultation and/or transfer of the baby.

- Complete blood count
- Major blood group and Rh typing; blood crossmatch
- Coombs' test (direct and indirect)
- Serum glucose
- Serum bilirubin (total and direct)
- Blood gas/pH
- Urinalysis
- Bacterial cultures and antibiotic sensitivities
- Serum sodium, potassium, chloride, bicarbonate, creatinine, BUN, magnesium, and calcium

LEVEL II-A AND LEVEL II-B FACILITIES

LEVEL II-A AND LEVEL II-B FACILITIES

I. SERVICES PROVIDED

Level II-A units provide a broad range of maternal-fetal and neonatal services for normal patients and for patients with mild obstetric and neonatal illnesses who do not require specialized services. They provide mechanical ventilatory support only for neonates who are being prepared for transfer to a Level III or Level II-B facility.

Level II-B facilities are qualified to manage some obstetric complications and neonates who are moderately ill. They must have the capacity to provide protracted ventilatory support under the supervision of a board-certified neonatologist.

A. Educational Services (Levels II-A and II-B)

Educational services should include the following:

1. Parent Education: Ongoing perinatal education programs for parents.

2. Nurses' Education: Programs for nurses that conform to the latest edition of the *Tennessee Perinatal Care System Educational Objectives for Nurses, Level II,* published by the Tennessee Department of Health. These courses should be made available periodically at Level II-A and Level II-B facilities by instructors on the staff of that institution and/or the staff from a Regional Perinatal Center. Courses may also transpire at a Regional Perinatal Center or at another site remote from the Level II-A or Level II-B hospital, thus requiring that the hospital provide nurses with educational leave for attendance. Level II-A and Level II-B hospitals are responsible for the necessary arrangements for nurse education. Nurses caring for infants on mechanical ventilatory support in Level II-B units must be educated according to guidelines specified for Level III.

3. Physicians' Education: A program of courses for physicians should be provided by the instructional staff of the Regional Perinatal Center and by qualified individuals on the staff of the Level II institution.

B. Antepartum Care (Levels II-A and II-B)

1. Uncomplicated Patients: Prenatal care for uncomplicated patients should meet criteria published in the latest edition of the *Guidelines for Perinatal Care*, jointly published by the American Academy of Pediatrics and the American College of Obstetricians and Gynecologists.

2. Identification and Planning for High-Risk Patients: Identification of the mother and fetus at high risk and multispecialty planning of management and therapy through the postpartum and neonatal periods should be routine. This planning should include the possibility of consultation with, or transfer to, a Level III facility.
3. Medical and Surgical Complications: Facilities must be available for patients with complications of pregnancy.

4. Laboratory Services: In-house or readily accessible laboratory services to assess fetal and maternal well-being should be available. Appropriate turnaround times for laboratory results are indispensable.

5. Fetal Evaluation: Antepartum fetal assessment and ultrasound visualization of the fetus should be available.

6. Social Services: Mechanisms should be available for provision of social services, either through the hospital department or by utilization of public and private agencies.

7. Home Nursing: Mechanisms should be available for the procurement of nursing services in patients' homes.

8. Nutrition Counseling: Nutritionists with special knowledge of prenatal dietary management should be available.

C. Intrapartum Care (Levels II-A and II-B)

1. Physical Facilities and Equipment: Physical facilities and equipment should meet the criteria outlined in the latest edition of the *Guidelines for Perinatal Care*, jointly published by the American Academy of Pediatrics and the American College of Obstetricians and Gynecologists, and any additional criteria as herein outlined.

2. Labor and Delivery Area: Labor and delivery rooms should occupy a clearly and specifically designated area in the hospital.

3. Complicated Intrapartum Care: There should be designated areas for intrapartum care of complications.

4. Cesarean Section: A capability for cesarean section with a short start-up time is essential. Operating rooms for cesarean sections are preferably located in the labor and delivery area.

5. Anesthesia: Anesthesia services must be readily available 24 hours daily.

6. Blood Bank Services: Blood bank services should be maintained at all times. An appropriately trained technician should be in-house 24 hours daily. All blood components must be available on an emergency basis, either on the premises or by pre-arrangement with another facility.

7. Imaging: Imaging services, including portable studies, should be available 24 hours daily.

8. Fetal Monitoring: A capability for continuous electronic fetal monitoring is mandatory.

9. Laboratory Services: Clinical laboratory services should be available to fully support clinical obstetric functions.

D. Postpartum Care (Levels II-A and II-B)

1. Space and Personnel: There should be an area specifically designated for high-risk postpartum care. In this area, nursing care must be administered by a registered nurse. A protocol for clinical observations is required. The care of low-risk mothers during the immediate recovery period must be administered or supervised by a registered nurse. A protocol for clinical observations is required.

2. Discharge Planning and Education: Specific personnel should be assigned this responsibility.

3. Family Planning: Family planning information and/or services must be available.

E. Neonatal Care (Levels II-A and II-B)

Level II-A facilities should have the capacity to manage normal and mildly ill infants. Level II-B units should also manage neonates who are moderately ill. The care of normal neonates should conform to standards in the latest edition of the *Guidelines for Perinatal Care*, jointly published by the American Academy of Pediatrics and the American College of Obstetricians and Gynecologists. Use of protracted mechanical ventilatory support is only appropriate for Level II-B facilities.

1. Resuscitation of Infants (Levels II-A and II-B): Provision must be made for resuscitation of infants immediately after birth. The capability for resuscitation should include assisted ventilation with oxygen administered by bag and mask or bag and endotracheal tube, chest compression, and appropriate intravascular therapy. A treatment station should be located in each delivery room with the following equipment: umbilical vessel catheterization tray; infant resuscitation bags, masks, and endotracheal tubes in appropriate sizes; laryngoscope and blades; a source of oxygen from wall outlets; suction apparatus; and appropriate drugs. Infusion pumps must be immediately available. An optimal thermal environment for the infant must be provided by a radiant warmer that is immediately available.

2. Transport from Delivery Room to the Special Care Nursery: Transport to a special care nursery requires a capacity for uninterrupted support. An appropriately equipped transport incubator should be used for this purpose.

3. Transitional Care: Careful recurrent observation of the neonate should be performed by personnel who can identify and respond to the early manifestations of neonatal disorders.

4. Care of Sick Infants: The Level II-A facility should be capable of treating mildly ill infants with disorders that include, but are not limited to, respiratory abnormalities that can be expected to require **only** hood

oxygen, hyperbilirubinemia, hypoglycemia, and superficial or localized infections. Level II-A units should also be qualified to deliver short-term ventilatory support to sustain life, pending transfer to a Level III (or Level II-B) facility. The care of sick infants is as follows:

a. In Level II-A units, the primary physician is a board-certified pediatrician. In Level II-B facilities, the primary care physician for sick neonates must be a board-certified neonatologist.
b. Expert interpretation of frequently performed and recorded physical examinations (II-A, II-B units).
c. Continuous cardiorespiratory monitoring (II-A, II-B units).
d. Serial laboratory blood gas determinations (II-A, II-B units).
e. Capacity for non-invasive blood gas monitoring (II-A, II-B units).
f. Periodic blood pressure determinations (II-A, II-B units), intra-arterial when necessary (II-B units only).
g. Portable diagnostic imaging for bedside interpretation (II-A, II-B units).
h. Continuous availability of recordings and interpretations of electrocardiograms (II-B units only).
i. Laboratory data available in accordance with the listing in paragraph E-7 of this section (p. 16).
j. Fluid and electrolyte management (II-A, II-B)
k. Administration of blood and blood components (II-A emergencies only; II-B units ongoing).
l. Phototherapy (II-A, II-B) and exchange transfusion (II-B units only).
m. Parenteral nutrition through peripheral or central vessels (II-B units only).

5. Protracted mechanical ventilatory support (Level II-B only):

a. For Level II-B institutions that provide protracted mechanical ventilation, in-house physician consultation and coverage must be provided 24 hours a day by a board-certified neonatologist; or a board-certified pediatrician; or a second year or higher level pediatric resident; or a neonatal nurse practitioner. However, when in-house coverage does not include a board-certified neonatologist, he/she must be on-call to be on-site within 30 minutes of request.
b. Continuous in-house presence of personnel experienced in airway management, endotracheal intubation, and diagnosis and treatment of air leak syndromes must be maintained.
c. A staff of nurses who are specifically educated in the management of neonatal respiratory disorders is required.
d. Blood gas determinations and other data essential to treatment must be available 24 hours daily.

6. Radiology: A radiologist must be available on-call at all times. Imaging services should be otherwise maintained 24 hours daily by in-house personnel (Levels II-A and II-B).

7. Laboratory Services: Laboratory capabilities should include the following determinations on microvolume samples (Levels II-A and II-B):

a. Routine Availability

- Clotting factors
- Serum total protein
- Serum albumin
- Serum IgM
- Serum triglycerides (for parenteral nutrition)
- Metabolic screen
- Liver function tests
- Serologic test for syphilis
- Serology for hepatitis
- Screening for HIV
- TORCH titers
- Viral cultures

b. Available 24 Hours - 7 Days Per Week

- Hematocrit
- Hemoglobin
- Complete blood count
- Reticulocyte count
- Blood typing: major groups and Rh
- Cross match
- Minor blood group antibody screen
- Coombs' test
- Prothrombin time
- Partial thromboplastin time
- Platelet count
- Fibrinogen concentration
- Serum sodium, potassium, chloride
- Serum calcium
- Serum phosphorus
- Serum magnesium
- Serum or blood glucose
- Therapeutic drug levels
- Serum bilirubin, total and direct
- Blood gases/pH
- Blood urea nitrogen
- Serum creatinine
- Serum/urine osmolalities
- Urinalysis
- Cerebrospinal fluid: cells, chemistry
- Bacterial cultures and sensitivities
- C-reactive protein (CRP)
- Gram stain

- Toxicology
- Group B strep screening
- Fetal fibronectin

8. Blood Bank Services (Levels II-A and II-B): Blood bank services should be maintained at all times. An appropriately trained technician should be in-house 24 hours daily. All blood components must be available on an emergency basis, either on the premises or by pre-arrangement with another facility.

F. Consultation and Transfer (Levels II-A and II-B)

The Level II-A and Level II-B facilities must maintain active relationships with a Level III facility in the region for consultation and transfer. Protocols for maternal-fetal and neonatal transport should conform to the most recent edition of the *Tennessee Perinatal Care System Guidelines on Transportation*, published by the Tennessee Department of Health. Unless emergency circumstances require otherwise, Level II-A facilities cannot receive transferred patients with maternal, fetal or neonatal illnesses. If a Level III referral is not available, these patients must be referred to a Level II-B facility.

1. Maternal-Fetal Consultation and Transport: The transport of mothers should be individually arranged by the Level II (A or B) and Level III facilities involved. In institutions without a staff neonatologist (Level II-A), if delivery is anticipated at gestational age of less than 34 weeks, transfer to a Level III facility must be initiated. However, even if the institution has a neonatologist (Level II-B) on its active staff, transfer to a Level III facility for maternal-fetal subspecialty care must be considered when gestational age is 32 weeks or less. (Paraphrased from page 11 in 5th edition, *Guidelines for Perinatal Care*.)

2. Neonatal Consultation and Transport: When the severity of an illness requires a level of care that exceeds the capacity of the Level II-A or Level II-B facility, the infant should be transferred to a Level III institution. Transport of these infants will usually be provided by the receiving Level III unit. A ground vehicle specifically designed for neonatal transport is usually utilized but other appropriate types of transport may also be arranged by referring and receiving institutions.

   In all circumstances, referral to a Level III facility must be considered for infants whose birthweights are 1000 grams or less; for birthweight less than 750 grams, transfer must occur. These considerations must be based upon the severity of illness and the availability of an appropriate level of neonatal care. For gestational ages and birthweights above the aforementioned limits, the physician's judgment concerning type and severity of maternal-fetal or neonatal illness is the sole basis for a decision to transfer a patient.

G. Maintenance of Data

The following items represent the minimum information that should be in medical records maintained at Level II facilities:

1. Maternal

- Name, hospital number
- Age, gravidity, parity, etc.
- Date of first prenatal visit
- Gestation (weeks)
- Prior cesarean section
- Electronic fetal monitoring (Yes or No)
- Induction (Yes or No)
- Indications for induction
- Time of membrane rupture
- Presentation
- Type of delivery (cesarean section, type of forceps, vacuum extraction, spontaneous)
- Indication for cesarean section
- Time of birth
- Birthweight
- Apgar scores (1 and 5 minutes)
- Resuscitation (Yes and No)
- Type of resuscitation
- Maternal-fetal complications
- Status of prenatal testing such as Group B strep, hepatitis B, etc.
- Anesthesia (type)
- Infant status on leaving delivery room (normal, abnormal, expired)
- Physician's name
- Nurse's name
- Disposition
  - Discharged home
  - Transferred to Level II-B or Level III facility
  - Expired

2. Neonatal

- Name, hospital number
- Date of birth
- Birthweight
- Gestational age
- Apgar scores (1 and 5 minutes)
- Maternal complications
- Discharge diagnoses
- Special care administered (specify)
- Disposition
  - Discharged home
  - Transferred to Level II-B or Level III facility
  - Expired

II. PERSONNEL: QUALIFICATIONS AND FUNCTIONS

Requirements for adequate staffing are based upon the assumption that patients will be transferred to a Level III facility when their illnesses necessitate a level of care that exceeds the capability of Level II-A or Level II-B facilities.

A. Physicians

1. Two individuals are co-directors of Level II-A facilities; one must be board certified in pediatrics and the other must be certified in obstetrics.

   The pediatric co-director for a Level II-B facility must be board certified in neonatal-perinatal medicine. The obstetric co-director of a Level II-B unit must be board certified in obstetrics.

2. The obstetric co-director of a Level II-A or Level II-B facility will, with the other physicians and the nursing staff, define and establish standardized procedures for all obstetric patients, will participate in and plan inservice educational programs, and will maintain communication and coordination with a related Level III facility or with the Regional Perinatal Center.

3. The pediatrician or neonatologist who is co-director of a Level II-A or Level II-B facility respectively is responsible for standards of care in all nursery facilities. The pediatrician or neonatologist should supervise and participate in perinatal educational programs of the hospital and should maintain communication and coordination of function with the director of the related Level III facility or Regional Perinatal Center. In collaboration with other physicians and with nurses on Level II-A or Level II-B staffs, the pediatrician or neonatologist will define and activate standardized procedures for all infants who receive care in any nursery in the hospital.

4. Full-time obstetric anesthesia by qualified anesthesia care providers is essential for both Level II-A and Level II-B institutions. It should be supervised by a qualified anesthesiologist. Alternative arrangements are the direct responsibility of the obstetric co-director of the Level II-A or Level II-B facility.
5. Normal deliveries should be attended by a physician or by a certified nurse midwife who is supervised by a physician. An individual who can resuscitate neonates should also be present for all deliveries (II-A and II-B units).

6. Deliveries of high-risk fetuses should be attended by an obstetrician and at least two other persons qualified in neonatal resuscitation whose only responsibility is the neonate (II-A and II-B units).

B. Obstetric Nurses (Levels II-A and II-B)

1. The Nurse Manager (R.N.) is responsible for all obstetric nursing activities. The nurse manager in a hospital with a Level II-A nursery must

complete the Level II course prescribed in the most recent edition of the *Tennessee Perinatal Care System Educational Objectives for Nurses, Level II*, published by the Tennessee Department of Health. If the hospital has a Level II-B nursery, she should complete the Level III course.

2. Staff nurses in obstetrics working in facilities with Level II-A nurseries must complete the Level II course outlined in the most recent edition of the *Tennessee Perinatal Care System Educational Objectives for Nurses, Level II*, published by the Tennessee Department of Health. In hospitals with Level II-B nurseries, the nurses should complete the Level III course.

3. The actual staffing pattern should provide adequate care for every intrapartum patient. A ratio of one nurse (R.N.) to two laboring patients who are at low risk is adequate. A nurse/patient ratio of 1:1 is required for management of all patients in second stage of labor and for laboring patients who have medical or obstetric complications.

4. The mother's care immediately following delivery must be supervised by a registered nurse. An institutional protocol for clinical observation is required.

5. A registered nurse is primarily responsible for the organization of care in the postpartum unit.

C. Neonatal Nurses (Intensive and Intermediate Care: Levels II-A and II-B)

1. The nurse manager (R.N.) is responsible for all nursing activities in the nurseries of Level II-A or Level II-B facilities. The nurse manager of a Level II-B unit must complete the Level III course prescribed for nurses in the most recent edition of the *Tennessee Perinatal Care System Educational Objectives for Nurses*, published by the Tennessee Department of Health. Nurse managers of Level II-A units must complete the prescribed Level II course.

2. All staff nurses (R.N.) must be skilled in the observation and treatment of sick infants. For Level II-A facilities, they should complete the Level II course for nurses outlined in the most recent edition of the *Tennessee Perinatal Care System Educational Objectives for Nurses*, published by the Tennessee Department of Health. For Level II-B facilities they should complete the Level III course for nurses.

3. Level II-A institutions should provide one staff nurse (R.N.) for every 3 to 4 patients, in addition to supporting nurse personnel.

   Level II-B facilities should provide staff nurses (R.N.) as follows (refer to the 5th edition, *Guidelines for Perinatal Care*):

   a. Uncomplicated care: one nurse for every 3 to 4 patients
   b. Intermediate care: one nurse for 2 or 3 patients
   c. Intensive care: one nurse for 1 or 2 patients

d. Unstable newborns requiring complex critical care: One or more nurses for one patient.

D. Respiratory Therapists

The functions of respiratory therapists should be prescribed by the medical director of the Level II-A or Level II-B nursery. A clearly delineated protocol is essential.

E. Social Workers (Levels II-A and II-B)

Social work services should be regularly accessible through a social service department of the hospital or by referral to public agencies or private organizations as established by a formal ongoing agreement. Social workers should be educated according to guidelines in *Educational Objectives for Perinatal Social Workers*, published by the Tennessee Department of Health. Social workers in Level II-B facilities should be on the permanent staff of the neonatal intensive care unit (NICU).

F. Nutritionist/Dietitian (Level II-B only)

Staff must include at least one nutritionist/dietitian who is knowledgeable in the management of parenteral and enteral nutrition of low birthweight and other high-risk infants.

At least one nutritionist/dietitian who is knowledgeable in the management of high risk mothers must also be on staff.

G. Pharmacist (Level II-B only)

A pharmacist with expertise in compounding and dispensing medications for neonates must be included on staff.

III. SPACE AND EQUIPMENT FOR LEVEL II-A AND LEVEL II-B FACILITIES

A. Physical facilities and equipment should meet criteria published in the latest edition of the *Guidelines for Perinatal Care*, jointly published by the American Academy of Pediatrics and the American College of Obstetricians and Gynecologists.

B. Minimal equipment for care of the normal infant includes:

1. A positive pressure bag and mask; endotracheal tubes in all the appropriate sizes for neonates.

2. A laryngoscope with premature and infant size blades.

3. Incubators and/or radiant warmers for adequate thermal support.

4. A platform scale, preferably with metric indicators.

5. A phototherapy apparatus.

6. A headbox assembly (oxygen hood), an oxygen blending device, and warming nebulizer for short-term administration of oxygen.

7. Oxygen flow meters, tubing, masks, binasal cannulas for short-term administration of oxygen.

8. A device for the external measurement of blood pressure from the infant's arm or thigh.

9. A controlled source of suction.

10. An oxygen analyzer that displays the ambient concentration of oxygen.

11. A pulse oximeter for non-invasive blood oxygen monitoring.

12. A fully equipped resuscitation cart.

13. Equipment for determination of blood glucose at the bedside.

14. An infusion pump.

C. Intermediate Care Nursery (Level II-A and Level II-B Facilities)

Minimum equipment for intermediate care infants includes:

1. A servo-controlled incubator or heated open bed for each infant who requires a controlled thermal environment.

2. Phototherapy apparatus.

3. Cardiorespiratory monitors that include pressure and waveform monitoring.

4. Pulse oximeters for non-invasive blood oxygen monitoring.

5. Oxygen analyzers, blenders, heaters, and humidifiers.

6. A sufficient number of head box assemblies (oxygen hoods).

7. Neonatal mechanical ventilators.

8. A resuscitation bag and mask for each infant.

9. An adequate supply of endotracheal tubes.

10. Laryngoscopes, with premature and infant blades.

11. A fully equipped resuscitation cart.

12. Neonatal infusion pumps.

13. A device for the external measurement of blood pressure from the infant's arm or thigh.

14. A device for viewing x-rays in the infant area.

15. Modulators for wall suction.

LEVEL III FACILITIES

LEVEL III FACILITIES

I. INTRODUCTION

Level III perinatal facilities provide care for severe and complicated disorders of maternal and neonatal patients as well as those who require normal or intermediate care. The responsibilities and capabilities that are prescribed for Level III facilities are solely concerned with the level of patient care. Designation as a Level III facility does not imply designation as a Regional Perinatal Center. The additional responsibilities of Regional Perinatal Centers are described elsewhere in these Guidelines.

The fundamental requirements of Level III facilities are as follows:

A. Physicians who are board certified in maternal-fetal medicine and physicians who are board certified in neonatal-perinatal medicine.

B. A full range of sub-specialty consultants.

C. A staff of nurses (R.N.) educated according to the most recent edition of the *Tennessee Perinatal Care System Educational Objectives for Nurses, Level III*, published by the Tennessee Department of Health, for responsibilities in all positions described herein.

D. Appropriate surgical facilities and personnel for mothers and neonates.

E. Imaging (x-ray, ultrasound, etc.) that is appropriate for management of the most complicated cases.

F. Laboratory facilities that are appropriate for management of the most complicated cases.

G. A capacity to accept referred patients from other hospitals and to supervise such transfer, if the institution chooses to provide referral services.

II. SERVICES PROVIDED

A. Educational Services

Educational services will be available as follows:

1. Parent Education: Ongoing perinatal education programs for parents.

2. Education of Personnel: Level III units are required to provide ongoing educational programs for their health care personnel. Outreach educational activities are not required.

B. Antepartum Care

A complete range of prenatal care for normal and complicated patients will be provided as follows:

1. Uncomplicated Patients: Prenatal care for uncomplicated patients should meet standards published in the most recent edition of the *Guidelines for Perinatal Care*, jointly published by the American Academy of Pediatrics and the American College of Obstetricians and Gynecologists.

2. Identification of High-Risk Mothers: Identification and multispecialty planning for management and therapy of the mother and the fetus at high risk must be ongoing.

3. In-patient Care of Complications: A designated antenatal area must be available for patients with complications of pregnancy.

4. Laboratory Services: In-house or readily accessible laboratory services to assess fetal and maternal well-being must be available (see paragraph E-7, p. 28). Appropriate turnaround time for laboratory results is indispensable.

5. Evaluation of Fetus: The full range of antepartum surveillance techniques must be available in house 24 hours a day. Genetic consultation and invasive fetal procedures (PUBS, CVS, others) should be available in-house.

6. Social Work: Full-time perinatal social workers must be on the staff of the hospital.

7. Home Nursing: Mechanisms must be available for the procurement of nursing services in patients' homes.

8. Nutrition Counseling: Nutritionists with special knowledge of prenatal dietary management should be available.

9. Pharmacy Services: Pharmacists with expertise in perinatal care must be available.

C. Intrapartum Care

1. Medical Personnel: An obstetrician and an anesthesiologist must be in-house 24 hours daily. Consultation with a maternal-fetal medicine specialist must be immediately available.

2. Physical Facilities and Equipment: Physical facilities and equipment should meet the standards in the most recent edition of the *Guidelines for Perinatal Care*, jointly published by the American Academy of Pediatrics and the American College of Obstetricians and Gynecologists, and any additional criteria as herein presented.

3. Labor and Delivery Area: Labor and delivery rooms must occupy a clearly and specifically designated area in the hospital.

4. Intensive Care Area: Intensive intrapartum care will be rendered in a clearly designated area. Nursing care of high-risk patients must be administered by registered nurses.

5. Cesarean Section: A capability for emergency cesarean section with a short start-up time is essential. Operating rooms for cesarean sections should be located in the labor and delivery area.

6. Anesthesia: Anesthesia services must be immediately available in-house 24 hours daily.

7. Blood Bank Services: Blood bank services must be maintained at all times. An appropriately trained technician should be available in-house 24 hours daily. All blood components must be obtainable on an emergency basis, either on the premises or by pre-arrangement with another facility.

8. Imaging: Imaging services must be available 24 hours daily, including the capacity to perform portable studies. Personnel who perform these services must be in-house 24 hours daily.

9. Fetal Monitoring: A capability for continuous electronic fetal monitoring is essential.

10. Laboratory Services: Clinical laboratory services must be available to fully support clinical obstetric functions (See page 28).

D. Postpartum Care

1. Postpartum Area: There must be specifically designated areas for postpartum care.

2. Intensive Care: Space, equipment and personnel for intensive care in the postpartum period must be provided. Nursing care of high-risk patients must be administered by registered nurses.

3. Discharge Planning and Education: Specific personnel should be assigned responsibility for assuring that mothers are given helpful preparation for the care of their infants at home.

4. Counseling for Complications: Personnel who are specifically qualified should be assigned responsibility for fully discussing with parents the complications of pregnancy and their implications for future pregnancies and fetal outcomes. Special attention should be given to families who experience fetal or neonatal death. Grief counseling is essential.

5. Family Planning: Family planning information and/or services must be available.

E. Neonatal Care

A Level III facility accommodates normal infants (unless located in a free-standing children's hospital), moderately ill, and severely ill infants who are either inborn or are transferred from other hospitals. The care of normal neonates should conform to the standards published in the most recent edition of the *Guidelines for Perinatal Care*, jointly published by the American Academy of Pediatrics and the American College of Obstetricians and Gynecologists. The principal commitment of a Level III facility is the care of sick neonates in an intensive care unit that is staffed and equipped to treat the most severe and complex neonatal disorders.

1. Resuscitation: Provision must be made for resuscitation of infants immediately after birth. The capability of resuscitation should include assisted ventilation with oxygen administered by bag and mask or bag and endotracheal tube, chest compression, and appropriate intravascular therapy. A treatment station should be located in each delivery room with the following equipment: umbilical vessel catheterization tray; infant resuscitation bags, masks, and endotracheal tubes in appropriate sizes; laryngoscope and blades; a source of oxygen from wall outlets; infusion pumps; suction apparatus; and appropriate drugs. An optimal thermal environment for the infant should be provided by a radiant warmer that is immediately available.

2. Transport from Delivery Room to the Special Care Nursery: Transport to a special care nursery requires a capacity for uninterrupted support. An appropriately equipped transport incubator should be used for this purpose.

3. Transitional Care: Recurrent observation of the neonate should be performed by personnel who can identify and respond to the early manifestations of neonatal disorders.

4. Care of Sick Neonates: The care of moderately and severely ill infants entails the following essentials:

    a. The primary care physician for sick neonates must be board certified in neonatal-perinatal medicine.
    b. Expert interpretation of frequently performed and recorded physical examinations.
    c. Continuous cardiorespiratory monitoring.
    d. Serial blood gas determinations and non-invasive blood gas monitoring.
    e. Periodic blood pressure determinations (intra-arterial when necessary).
    f. Portable diagnostic imaging for bedside interpretation.
    g. Continuous availability of recordings and interpretations of electrocardiograms and echocardiograms.
    h. Laboratory data in accordance with the listing in paragraph E-7 (p. 28).

i. Fluid and electrolyte management and administration of blood and blood components.
j. Phototherapy and exchange transfusion.
k. A capacity for sustained mechanical ventilatory support (see paragraph E-5, p. 28).
l. Administration of parenteral nutrition through peripheral vessels or central vessels.
m. Provision of appropriate enteral nutrition.
n. In-house physician consultation and coverage shall be provided 24 hours a day by a board-certified neonatologist; or a board-certified pediatrician; or a second year or higher level pediatric resident; or a neonatal nurse practitioner. However, when in-house coverage does not include a board-certified neonatologist, he/she must be on-call and available to be on-site within 30 minutes of request.

5. Mechanical Ventilatory Support: The Level III unit must be qualified to provide mechanical ventilatory support for any required duration. The essential qualifications are as follows:

a. Continuous in-house presence of personnel experienced in airway management, endotracheal intubation, and diagnosis and treatment of air leak syndromes.
b. A staff of nurses (R.N.) who are specifically educated in the management of neonatal respiratory disorders.
c. Blood gas determinations and other data essential to treatment must be available 24 hours daily.

6. Radiology: A radiologist must be available on-call at all times. In-house diagnostic imaging services should be maintained 24 hours daily.

7. Laboratory Services: Laboratory capabilities should include the following determinations on microvolume samples:

a. Routine Availability

- Coagulation profile
- Specific clotting factors
- Serum total protein
- Serum albumin
- Serum IgM
- Metabolic screen
- Liver function tests
- Serologic test for syphilis
- Serologic test for hepatitis
- Screening for HIV
- TORCH titers
- Virus cultures

b. Availability 24 Hours - 7 Days Per Week

- Hematocrit
- Hemoglobin
- Complete blood count, reticulocyte count
- Blood typing; major groups and Rh
- Crossmatch
- Minor blood group antibody screen
- Coombs' test
- Prothrombin time
- Partial thromboplastin time
- Platelet count
- Fibrinogen concentration
- Serum sodium, potassium, chloride
- Serum calcium
- Serum phosphorus
- Serum magnesium
- Serum or blood glucose
- Therapeutic drug levels
- Serum triglycerides
- Serum bilirubin, total and direct
- Blood gases/pH
- Blood urea nitrogen
- Serum creatinine
- Serum/urine osmolalities
- Urinalysis
- Cerebrospinal fluid: cells, chemistry
- Bacterial cultures and sensitivities
- C-reactive Protein (CRP)
- Fetal fibronectin
- Toxicology screen
- Group B strep screening
- Gram stain

8. Blood Bank Services: Blood bank services must be maintained at all times. An appropriately trained technician should be available in-house 24 hours daily. All blood components must be obtainable on an emergency basis, either on the premises or by pre-arrangement with another facility.

F. Consultation and Transfer

1. Maternal-Fetal Transport: If the Level III facility chooses to accept referred patients, it should supervise the transport of mothers who are referred by any institution. The logistics and mode of transport of each maternal patient should be individually determined by the Level III facility and the referring institution, conforming to the most recent *Tennessee Perinatal Care System Guidelines on Transportation*, published by the Tennessee Department of Health. Transport should also conform to regulations prescribed by the State for emergency transport of other types of patients,

of patients, but only when such conformity does not impair management of the pregnant woman in transport. Detailed records of the maternal transport system should be maintained by the Level III facility.

2. Neonatal Transport:

   a. The Level III facility that operates a transport service is required to maintain equipment and a trained team of personnel for the transport of newborn patients. The team and equipment must be available at all times. The Level III facility is responsible for transport of referred infants with its own equipment, or alternatively, with equipment from a commercial source.

   b. The Level III facility that operates a transport service should originate a protocol that describes procedures, staffing patterns, and equipment for the transport of referred infants. The protocol should conform to the most recent edition of the *Tennessee Perinatal Care System Guidelines on Transportation*, published by the Tennessee Department of Health.

   c. The Level III facility that operates a transport service is required to maintain records of its activities. (See the most recent edition of the *Tennessee Perinatal Care System Guidelines on Transportation*.)

G. Maintenance of Data

A systematic ongoing compilation of data should be maintained to reflect the care of sick patients, in addition to the listing of minimal data that is specified for Level I and Level II facilities.

III. PERSONNEL: QUALIFICATIONS AND FUNCTIONS

A. Physicians

1. Co-directors: Administrative and medical direction of maternal-fetal medicine services is the responsibility of a full-time obstetric co-director who is board certified in maternal-fetal medicine. Administrative and medical direction of the newborn service is the responsibility of a pediatric co-director who is board certified in neonatal-perinatal medicine. These co-directors are responsible for the maintenance of standards of patient care; the coordination of staff nurses, advanced practice nurses, physicians, laboratory personnel and other support functions of patient care; participation in the development of an operating budget; evaluation and purchase of equipment; planning and development of intramural as well as any outreach education programs; and coordination of working relationships with other hospitals in the region.

2. Obstetricians: Board-certified obstetricians, whose qualifications and appointments have been approved by the appropriate hospital committee,

may assume primary responsibility for the hospital care of high-risk patients. However, the institution is responsible for development of a protocol that prescribes circumstances in which the obstetrician will consult the maternal-fetal specialist.

3. Pediatricians: A board-certified neonatologist must have primary and ultimate responsibility for infants who receive intensive (maximal) care. Board-certified pediatricians, whose qualifications and appointments have been approved by the appropriate hospital committee, may have primary responsibility for infants who require other than routine care after consultation with the neonatologist.

4. Anesthesiologists: Obstetric anesthesia services should be directed by a board-certified anesthesiologist who has a special interest and an expertise in obstetric anesthesia. Pediatric anesthesia services should be directed by a board-certified anesthesiologist who has a special interest and an expertise in pediatric anesthesia.

5. Sub-specialty Consultants: Sub-specialty consultants for obstetric patients should include, at a minimum, a perinatal sonologist, hematologist, cardiologist, and other appropriate sub-specialists in internal medicine, such as infectious diseases, and surgery. A geneticist for obstetric and newborn patients should maintain an ongoing service program, either as a member of the active staff of the hospital, or as a consultant whose responsibility for the hospital's genetic program is clearly identifiable.

Qualified pediatric consultants should be readily available. At a minimum, these board-certified pediatric sub-specialists should include a radiologist, cardiologist, surgeon, neurologist, hematologist, and pathologist. Consultation should also be available for problems in pulmonology, renal function, metabolism, endocrinology, gastroenterology, hospital epidemiology, infectious diseases, and ophthalmology. Surgical sub-specialists such as cardiovascular surgeons, plastic surgeons, and neurosurgeons, as well as orthopedic, urologic, and ear-nose-throat surgeons, should be regularly available for consultation and for continuous patient management.

B. Obstetric Nurses

1. The nurse manager in a Maternal-Fetal unit should have completed education according to the most recent edition of the *Tennessee Perinatal Care System Educational Objectives for Nurses, Level III*, published by the Tennessee Department of Health. A baccalaureate degree is required.

2. In Level III facilities, staff nurses (R.N.) in obstetrics who are concerned with Level II or Level III care should have completed Level III education according to the most recent edition of the *Tennessee Perinatal Care System Educational Objectives for Nurses, Level III*, published by the Tennessee Department of Health.

3. The Level III obstetric unit should have at least one advanced practice obstetric nurse on its full-time staff who is responsible for staff education.

4. Recommended Staffing Levels: The nurse (R.N.)/patient staffing levels listed in this section are those recommended in the most recent (5th) edition of *Guidelines for Perinatal Care*, which was jointly published by the American Academy of Pediatrics and the American Academy of Obstetricians and Gynecologists in 2002.

   Intrapartum: A ratio of one nurse (R.N.) to two laboring patients is considered adequate. An R.N./patient ratio of 1:1 is required for management of laboring patients who have medical or obstetric complications, or are in the second stage of labor.

   Antepartum / Postpartum: For antepartum or postpartum patients who have complications but are in stable condition, the recommended nurse (R.N) to patient ratio is 1:3.

   In-house minimal staffing for care of antepartum and postpartum patients should be adequate to handle possible emergencies. Sufficient staff skilled in obstetrics should be immediately available and free to respond to these emergencies without decreasing the unit staffing below safe levels as described above.

C. Neonatal Nurses

1. The nurse manager of the Level III nursery should have completed education according to the most recent edition of the *Tennessee Perinatal Care System Educational Objectives for Nurses, Level III*, published by the Tennessee Department of Health. A baccalaureate degree is required.

2. Staff nurses (R.N.) must have received courses as outlined in the most recent edition of the *Tennessee Perinatal Care System Educational Objectives for Nurses, Level III*, published by the Tennessee Department of Health.

3. The Level III nursery should have at least one advanced practice neonatal nurse on its full-time staff who is responsible for staff education.

4. Recommended Staffing Levels: The nurse (R.N.)/patient staffing levels listed in this section are those recommended in the most recent (5th) edition of *Guidelines for Perinatal Care*, which was jointly published by the American Academy of Pediatrics and the American Academy of Obstetricians and Gynecologists in 2002.

   Level III facilities should provide staff nurses (R.N.) as follows:

   a. Intermediate care: One nurse for 2 or 3 patients

b. Intensive care: One nurse for 1 or 2 patients
c. Newborns requiring multisystem support: One nurse for 1 patient.
d. Unstable newborns requiring complex critical care: One or more nurses for one patient.

D. Social Workers

The services of social workers should be made available by the hospital 24 hours daily. These services should be provided by a staff that is qualified in perinatal social work. This requires that social workers be educated according to the most recent edition of the *Tennessee Perinatal Care System Educational Objectives in Medicine for Perinatal Social Workers,* published by the Tennessee Department of Health.

E. Respiratory Therapists

The functions of respiratory therapists should be prescribed by the medical director (or a designee) of the intensive care facility. A clearly delineated protocol is essential.

F. Nutritionist/Dietitian

The staff must include at least one nutritionist/dietitian who is knowledgeable in the management of parenteral and enteral nutrition of low birthweight and other high-risk infants.

The Maternal-Fetal unit must also include at least one nutritionist/dietitian who has expertise in perinatal nutrition and can plan diets that meet the special needs of high risk mothers.

G. Pharmacist

A pharmacist with expertise in compounding and dispensing medications for neonates must be included on staff. Pharmacists with expertise in dispensing neonatal medications must be available 24 hours a day.

H. Occupational Therapist or Physical Therapist

At least one occupational or physical therapist with neonatal expertise must be included on staff.

IV. EQUIPMENT FOR THE INTENSIVE CARE NURSERY

Equipment in the intensive care nursery of a Level III facility should be adequate for the care of moderately and severely ill infants in accordance with contemporary standards. The quantities of all items of equipment should be sufficient to support the management of the maximum number of infants that are anticipated at times of peak census loads. An in-house Bioengineering Department should have an active program for preventive maintenance and rapid repair.

REGIONAL PERINATAL CENTERS

REGIONAL PERINATAL CENTERS

I. REGIONS DEFINED

There are five perinatal regions in Tennessee: Northeast, East, Southeast, Middle, and West. Each region is comprised of a group of contiguous counties. The perinatal regions and the counties comprising them are listed on page 38. Each region contains one Regional Perinatal Center, which has been so designated by the Commissioner of the Tennessee Department of Health.

II. REGIONAL PERINATAL CENTERS LISTED

Each of Tennessee's five Regional Perinatal Centers is capable of providing Level III obstetric and neonatal care. The Regional Perinatal Centers are:

Northeast Tennessee Regional Perinatal Center
Johnson City Medical Center Hospital
Johnson City, Tennessee
Perinatal Center office: (423) 431-6640
L&D: 1-800-365-5262
NICU: (423) 431-6671

East Tennessee Regional Perinatal Center
The University of Tennessee Medical Center at Knoxville
Knoxville, Tennessee
L&D: (865) 544-9830
1-800-422-9301 (referrals)
ICN: (865) 544-9834
Neonatal: 1-800-521-8231

Southeast Tennessee Regional Perinatal Center
Erlanger Medical Center/T.C. Thompson Children's Hospital
Chattanooga, Tennessee
L&D: (423) 778-7956
Transfer: (423) 778-8100
1-866-4HI-RISK
NICU: (423) 778-6438

Middle Tennessee Regional Perinatal Center
Vanderbilt University Medical Center/Vanderbilt Children's Hospital
Nashville, Tennessee
L&D: (615) 322-2555
NICU: (615) 322-0963

West Tennessee Regional Perinatal Center
Regional Medical Center at Memphis
Memphis, Tennessee
L&D: (901) 545-7345
OB Inpatient Transport: (901) 545-8181
NICU: (901) 545-7366

III. SERVICES PROVIDED

Tennessee's Regional Perinatal Centers must provide the following services:

A. Consultation and Referral

1. If no other appropriate facility is available to manage significant high-risk conditions, the Regional Perinatal Center must accept all such patients regardless of financial status.

2. Telephone consultation by obstetric and newborn sub-specialists must be available to physicians and nurses within the region 24 hours daily.

B. Professional Education

1. For the Staff of the Regional Perinatal Center: A program of professional education must be maintained for the staff of the Regional Perinatal Center. These programs should satisfy the educational requirements for physicians, nurses, social workers, and others who function in the administration of Level III care.

2. For the Staff of Other Hospitals in the Region: The Regional Perinatal Center must maintain a program of professional education for hospitals within its region. These programs of instruction require a staff of qualified educators to present ongoing courses to Level I, II, and III hospitals. These courses must satisfy the educational objectives set forth in the series of publications for the education of nurses and social workers published by the Tennessee Department of Health. These courses must be free of charge to individuals on the staff of any hospital in the State.

C. Maternal-Fetal and Neonatal Transport

The Regional Perinatal Center is responsible for maternal-fetal and neonatal transport described for Level III facilities elsewhere in these Guidelines. Whereas the provision of these transport services is an option for Level III units that do not function as Regional Perinatal Centers, transport services are required of a Regional Perinatal Center. Transport for the purpose of admission to the Regional Center must be made available to all patients within the region regardless of their financial status, and to patients referred from other Regional Perinatal Centers.

D. Site Visits

The Regional Perinatal Center staff will engage in site visits upon request within its region.

E. Post-neonatal Follow-up

Follow-up evaluation of selected infants who are discharged from the Regional Perinatal Center should be performed.

F. Data Collection

The Regional Perinatal Center must compile data on patients according to requirements prescribed by the Tennessee Perinatal Care System. These data will be forwarded to a central facility.

PERINATAL REGIONS

NORTHEAST TENNESSEE (Johnson City)

Carter
Greene
Hancock
Hawkins
Johnson
Sullivan
Unicoi
Washington

EAST TENNESSEE (Knoxville)

Anderson
Blount
Campbell
Claiborne
Cocke
Cumberland
Fentress
Grainger
Hamblen
Jefferson
Knox
Loudon
Monroe
Morgan
Pickett
Roane
Scott
Sevier
Union

SOUTHEAST TENNESSEE (Chattanooga)

Bledsoe
Bradley
Grundy
Hamilton
McMinn
Marion
Meigs
Polk
Rhea
Sequatchie

MIDDLE TENNESSEE (Nashville)

Bedford
Cannon
Cheatham
Clay
Coffee
Davidson
Dekalb
Dickson
Franklin
Giles
Hickman
Houston
Humphreys
Jackson
Lawrence
Lewis
Lincoln
Macon
Marshall
Maury
Montgomery
Moore
Overton
Perry
Putnam
Robertson
Rutherford
Smith
Stewart
Sumner
Trousdale
Van Buren
Warren
Wayne
White
Williamson
Wilson

WEST TENNESSEE (Memphis)

Benton
Carroll
Chester
Crockett
Decatur
Dyer
Fayette
Gibson
Hardeman
Hardin
Haywood
Henderson
Henry
Lake
Lauderdale
McNairy
Madison
Obion
Shelby
Tipton
Weakley

TENNESSEE PERINATAL REGIONS AND PERINATAL CENTERS